

CLAIMS

What is claimed is:

1. An optical recording medium comprising:
a read-only storage area;
a writable storage area;
a read-only lead-in area having first control information for both the read-only and
writable storage areas; and
a writable lead-in area having second control information relating to the writable
storage area.

2. The optical recording medium according to claim 1, wherein:
the read-only storage area comprises
the read-only lead-in area,
a read-only memory (ROM) data area, and
a read-only lead-out area; and
the writable storage area comprises
the writable lead-in area which comprises a connection zone to connect the read-
only storage area and the writable storage area,
a random access memory (RAM) data area, and
a read-only lead-out area.

3. The optical recording medium according to claim 2, wherein the read-only lead-
in area comprises hybrid identification information indicating that the optical recording
medium is a hybrid disc having the read-only storage area and the writable storage area.

1 4. The optical recording medium according to claim 3, wherein the hybrid
2 identification information comprises information indicating a presence or absence of the
3 writable storage area, and information on a part version of the hybrid disc.

1 5. The optical recording medium according to claim 1, wherein the read-only lead-
2 in area comprises hybrid identification information indicating that the optical recording
3 medium is a hybrid disc having the read-only storage area and the writable storage area.

1 6. The optical recording medium according to claim 2, wherein the hybrid
2 identification information comprises information indicating a presence or absence of the
3 writable storage area, and information on a part version of the hybrid disc.

1 7. The optical recording medium according to claim 1, wherein:
2 the writable storage area comprises a control data zone; and
3 the read-only lead-in area comprises first physical format information of the read-only
4 storage area and second physical format information of the control data zone.

1 8. The optical recording medium according to claim 7, wherein the first physical
2 format information comprises reserved bytes which stores the second physical format
3 information.

1 9. The optical recording medium according to claim 2, wherein:
2 the writable storage area comprises a control data zone; and
3 the read-only lead-in area comprises physical format information of the read-only
4 storage area and physical format information of the control data zone.

1 10. The optical recording medium according to claim 7, wherein the first physical
2 format information comprises reserved bytes which stores the second physical format
3 information.

1 11. The optical recording medium according to claim 1, wherein the read-only
2 storage area and the read-only lead-in area are compatible with a read-only memory (ROM)
3 specification.

1 12. The optical recording medium according to claim 11, wherein the ROM
2 specification is a digital versatile disc (DVD)-ROM specification and the writable storage area
3 and the writable lead-in area are compatible with a DVD-RAM specification.

1 13. The optical recording medium according to claim 1, wherein a minimum size of
2 the writable storage area is at least as great as a size of a single zone defined by a digital
3 versatile disc random access memory (DVD-RAM) specification.

1 14. The optical recording medium according to claim 1, wherein:
2 the read-only storage area has a start position at a diameter of approximately 48mm,
3 and an ending position at a diameter greater than the approximately 48mm and less than
4 approximately 116mm if the optical recording medium has a diameter of approximately
5 120mm, and has the start position at a diameter of approximately 48mm, and an ending
6 position at a diameter greater than the approximately 48mm and less than approximately 76mm
7 if the optical recording medium has a diameter of approximately 80mm; and
8 the writable storage medium is arranged in a remaining area of the optical recording
9 medium which does not contain read-only data.

1 15. The optical recording medium according to claim 1, wherein the read-only lead-
2 in area comprises:

3 a control data zone which stores the first control information.

1 16. The optical recording medium according to claim 15, wherein the first control
2 information comprises:

3 physical format information for the read-only storage area;

4 hybrid disc identification information indicating that the optical recording medium is a
5 hybrid disc having the read-only storage area and the writable storage area; and

6 physical format information for the writable storage area.

1 17. The optical recording medium according to claim 16, wherein the physical
2 format information for the writable storage area is stored in bytes 1024 through 2047 of the
3 first control information.

1 18. The optical recording medium according to claim 17, wherein the physical
2 format information for the read-only storage area is stored in bytes 0 through 16 of the first
3 control information and the hybrid disc identification information is stored in bytes 17 and 18
4 of the first control information.

1 19. The optical recording medium according to claim 16, wherein the physical
2 format information for the read-only storage area comprises:
3 book type information indicating that the optical recording medium is compatible with a
4 digital versatile disk read-only memory (DVD-ROM) specification; and
5 a part version indicating a version number of the optical recording medium.

1 20. The optical recording medium according to claim 18, wherein the physical
2 format information for the read-only storage area comprises:
3 book type information indicating that the optical recording medium is compatible with a
4 digital versatile disk read-only memory (DVD-ROM) specification; and
5 a part version information indicating a version number of the optical recording medium;
6 wherein the book type information and part version information are stored in byte 0 of
7 the first control information.

1 21. The optical recording medium according to claim 16, wherein the hybrid disc
2 information comprises part version information indicating a version number of the hybrid disc.

1 22. The optical recording medium according to claim 20, wherein the hybrid disc
2 information comprises:
3 existence information indicating that the optical recording medium is a hybrid disc
4 having the read-only storage area and the writable storage area; and
5 part version information indicating a version number of the hybrid disc,
6 wherein the existence information and the part version information are stored in bytes
7 17 and 18 of the physical format information.

1 23. The optical recording medium according to claim 1, wherein the second control
2 information comprises:
3 a connection zone which connects the read-only storage area and the writable storage
4 area;
5 at least one defect management zone; and
6 a drive test zone.

1 24. The optical recording medium according to claim 16, wherein the second
2 control information comprises:
3 a connection zone which connects the read-only storage area and the writable storage
4 area;
5 at least one defect management zone; and
6 a drive test zone.

1 25. An optical recording medium comprising:
2 a dual layered read-only storage area at an inner part of the optical recording medium;
3 and
4 a single layered writable storage area at an outer part of the optical recording medium.

1 26. The optical recording medium according to claim 25, wherein the optical
2 recording medium further comprises:
3 a first substrate having a first layer of the dual layered read-only storage area at an
4 inner part of the first substrate and the single layered writable storage area at an outer part of
5 the first substrate; and
6 a second substrate attached to the first substrate, having a second layer of the dual
7 layered read-only storage area at an inner part of the second substrate.

1 27. The optical recording medium according to claim 26, wherein:
2 the dual layered read-only storage area includes a lead-in area having first control
3 information for both the dual layered read-only and single layered writable storage areas; and
4 the single layered writable storage area has a lead-in area having second control
5 information relating to the single layered writable storage area.

1 28. An optical recording medium comprising:
2 a first substrate having a transparent region at an inner part of the first substrate and a
3 writable storage area at an outer part of the first substrate;
4 a second substrate attached to the first substrate, having a read-only storage area at an
5 inner part of the second substrate; and
6 wherein light beams to read from the read-only storage area and write to the writable
7 storage area are to be incident on the first substrate before being incident on the second
8 substrate.

1 29. The optical recording medium according to claim 28, wherein:
2 the read-only storage area includes a lead-in area having first control information for
3 both the read-only and writable storage areas; and
4 the writable storage area has a lead-in area having second control information relating
5 to the writable storage area.

1 30. An optical recording medium comprising:
2 a first substrate having a read-only storage area at an inner part of the first substrate
3 and a writable storage area at an outer part of the first substrate;
4 a second substrate attached to the first substrate, having transparent regions at the inner
5 and outer parts of the second substrate.

1 31. The optical recording medium according to claim 30, wherein:
2 the read-only storage area includes a lead-in area having first control information for
3 both the read-only and writable storage areas; and
4 the writable storage area has a lead-in area having second control information relating
5 to the writable storage area.

1 32. An optical recording medium comprising:

2 a dual layered read-only storage area at an inner part of the optical recording medium;

3 and

4 a dual layered writable storage area at an outer part of the optical recording medium.

1 33. The optical recording medium according to claim 32, wherein the optical
2 recording medium further comprises:

3 a first substrate having a first layer of the dual layered read-only storage area at an
4 inner part of the first substrate and a first layer of the dual layered writable storage area at an
5 outer part of the first substrate; and

6 a second substrate attached to the first substrate, having a second layer of the dual
7 layered read-only storage area at an inner part of the second substrate and a second layer of the
8 dual layered writable storage area at an outer part of the second substrate.

1 34. The optical recording medium according to claim 33, wherein:

2 the dual layered read-only storage area includes a lead-in area having first control
3 information for both the dual layered read-only and dual layered writable storage areas; and

4 the dual layered writable storage area has a lead-in area having second control
5 information relating to the dual layered writable storage area.

1 35. An optical recording medium comprising:

2 a read-only storage area extending from an inner part to an outer part of the optical
3 recording medium; and

4 a writable storage area extending from an inner part to an outer part of the optical
5 recording medium.

1 36. The optical recording medium according to claim 35, wherein the optical
2 recording medium further comprises:

3 a first substrate having the read-only storage area extending from an inner part to an
4 outer part of the first substrate; and

5 a second substrate attached to the first substrate, having a transparent region extending
6 from an inner part to an outer part of the second substrate.

1 37. The optical recording medium according to claim 36, wherein:

2 the read-only storage area includes a lead-in area having first control information for
3 both the read-only and writable storage areas; and

4 the writable storage area has a lead-in area having second control information relating
5 to the writable storage area.

1 38. An dual sided optical recording medium comprising:

2 first and second dual layered read-only storage areas at an inner part of the optical
3 recording medium; and

4 first and second single layered writable storage areas at an outer part of the optical
5 recording medium.

1 39. The dual sided optical recording medium according to claim 38, wherein the
2 optical recording medium further comprises:

3 a first substrate having the first dual layered read-only storage area at an inner part of
4 the first substrate and the first single layered writable storage area at an outer part of the first
5 substrate; and

6 a second substrate attached to the first substrate, having the second dual layered read-
7 only storage area at an inner part of the second substrate and the second single layered writable
8 storage area at an outer part of the second substrate.

1 40. The dual sided optical recording medium according to claim 39, wherein:
2 the first dual layered read-only storage area includes a lead-in area having first control
3 information for both the first dual layered read-only and first single layered writable storage
4 areas;
5 the second dual layered read-only storage area includes a lead-in area having first
6 control information for both the second dual layered read-only and second single layered
7 writable storage areas;
8 the first single layered writable storage area has a lead-in area having second control
9 information relating to the first single layered writable storage area; and
10 the second single layered writable storage area has a lead-in area having second control
11 information relating to the second single layered writable storage area.

1 41. A digital versatile disc (DVD) comprising:
2 a read-only storage area having a lead-in area and a data area;
3 a writable storage area having a lead-in area and a data area;
4 wherein the lead-in area of read-only storage area comprises physical format
5 information for the read-only storage area and the writable storage.

1 42. The DVD according to claim 41, wherein the lead-in area of the read-only
2 storage area comprises hybrid disc information indicating whether the writable storage area
3 exists.

1 43. The DVD according to claim 41, wherein the lead-in area of the writable
2 storage area comprises physical format information for the writable storage area, including a
3 connection zone which connects the read-only storage area and the writable storage area, at
4 least one defect management zone, and a drive test zone.

1 44. The DVD according to claim 41, wherein the lead-in area of the writable
2 storage area comprises physical format information for the writable storage area, including a
3 connection zone which connects the read-only storage area and the writable storage area, at
4 least one defect management zone, and a drive test zone.

1 45. An apparatus for recording and reproducing data onto/from an optical recording
2 medium having a read-only storage area at an inner part of the optical recording medium and a
3 writable storage area at an outer part of the optical recording medium, the apparatus
4 comprising:

5 a system controller which generates identification information to indicate that the
6 optical recording medium is a hybrid disc having the read-only storage area and the writable
7 storage area; and

8 a recording and/or reproducing unit which records or reads data from the read-only
9 storage area and the writable storage area based on the generated identification information
10 which is stored in a lead-in area of the read-only storage area.

1 46. The apparatus according to claim 45, wherein:

2 the system controller generates first control information for both the read-only and
3 writable storage areas and second control information relating to the writable storage area; and
4 the recording and/or reproducing unit records the first control information in the lead-in
5 area of the read-only storage area and records the second control information in a lead-in area
6 of the writable storage area.

1 47. The apparatus according to claim 46, wherein the second control information
2 comprises:

3 a connection zone to connect the read-only storage area and the writable storage area;
4 a defect management zone to manage defects in the writable storage area; and
5 a drive test zone.

1 48. The apparatus according to claim 46, wherein the first control information
2 comprises:

3 physical format information of the read-only storage area; and
4 physical format information of a control data zone of the writable storage area.

1 49. The apparatus according to claim 48, wherein:
2 the second control information comprises:

3 a connection zone to connect the read-only storage area and the writable storage
4 area,

5 a defect management zone to manage defects in the writable storage area, and
6 a drive test zone; and

7 reproducing and/or reproducing unit reads the physical format information for
8 the read-only storage area and the writable storage area to reproduce data in the read-only
9 storage area and the writable storage areas, respectively, and reads the connection zone, defect
10 management zone and drive test zone to control the data in the writable storage area.

1 50. The apparatus according to claim 45, wherein the identification information
2 comprises information indicating a presence or absence of the writable storage area on the
3 hybrid disc, and information on a part version of the hybrid disc.

1 51. The apparatus according to claim 45, wherein the recording and/or reproducing
2 unit records the first control information using reserved bytes of physical format information
3 according to a digital versatile disc (DVD) specification.

1 52. The apparatus according to claim 45, wherein the
2 recording and/or reproducing unit controls a reference linear velocity for reproducing
3 the data in the read-only storage area to be the same as a reference linear velocity of data at an
4 innermost part of the writable storage area.

1 53. The apparatus according to claim 45, wherein the read-only lead-in area
2 comprises:
3 a control data zone which stores the first control information.

1 54. The apparatus according to claim 53, wherein the first control information
2 comprises:
3 physical format information for the read-only storage area;
4 hybrid disc identification information indicating that the optical recording medium is a
5 hybrid disc having the read-only storage area and the writable storage area; and
6 physical format information for the writable storage area.

1 55. The apparatus according to claim 54, wherein the physical format information
2 for the writable storage area is stored in bytes 1024 through 2047 of the first control
3 information.

1 56. The apparatus according to claim 55, wherein the physical format information
2 for the read-only storage area is stored in bytes 0 through 16 of the first control information
3 and the hybrid disc identification information is stored in bytes 17 and 18 of the first control
4 information.

1 57. The apparatus according to claim 56, wherein the physical format information
2 for the read-only storage area comprises:
3 book type information indicating that the optical recording medium is compatible with a
4 digital versatile disk read-only memory (DVD-ROM) specification; and
5 a part version information indicating a version number of the optical recording medium;
6 wherein the book type information and part version information are stored in byte 0 of
7 the first control information.

1 58. The apparatus according to claim 54, wherein the physical format information
2 for the read-only storage area comprises:
3 book type information indicating that the optical recording medium is compatible with a
4 digital versatile disk read-only memory (DVD-ROM) specification; and
5 a part version indicating a version number of the optical recording medium.

1 59. The apparatus according to claim 58, wherein the hybrid disc information
2 comprises:
3 existence information indicating that the optical recording medium is a hybrid disc
4 having the read-only storage area and the writable storage area; and
5 part version information indicating a version number of the hybrid disc,
6 wherein the existence information and the part version information are stored in bytes
7 17 and 18 of the physical format information.

1 60. The apparatus according to claim 54, wherein the hybrid disc information
2 comprises part version information indicating a version number of the hybrid disc.

1 61. The apparatus according to claim 54, wherein the second control information
2 comprises:

3 a connection zone which connects the read-only storage area and the writable storage
4 area;

5 at least one defect management zone; and

6 a drive test zone.

1 62. The apparatus according to claim 45, wherein the second control information
2 comprises:

3 a connection zone which connects the read-only storage area and the writable storage
4 area;

5 at least one defect management zone; and

6 a drive test zone.

1 63. The apparatus according to claim 45, wherein the optical recording medium has
2 first control information for both the read-only and writable storage areas in the lead-in area of
3 the read-only storage area and second control information relating to the writable storage area
4 in a lead-in area of the writable storage area, the recording and/or reproducing unit reading the
5 first and second control information so that the system controller causes the recording
6 and/or reproducing unit to read the data from the read-only and writable storage areas based
7 upon the first and second control information.

1 64. The apparatus according to claim 48, wherein the recording and/or reproducing
2 unit reads the first control information from reserved bytes of physical format information
3 according to a digital versatile disc (DVD) specification.

1 65. An apparatus for reproducing data from an optical recording medium having
2 read-only storage area at an inner part and a writable storage area at an outer part of the optical
3 recording medium, the apparatus comprising:

4 a reproducing unit which reproduces data from the read-only storage area and the
5 writable storage area; and

6 a system controller which controls a reference linear velocity of the reproducing unit
7 for reproduction of the data in the read-only storage area to be the same as a reference linear
8 velocity for reproduction of the data in an innermost part of the writable storage area.

1 66. A method of recording and reproducing data onto/from an optical recording
2 medium having a read-only storage area at an inner part of the optical recording medium and a
3 writable storage area at an outer part of the optical recording medium, the method comprising:

4 generating identification information to indicate that the optical recording medium is a
5 hybrid disc having the read-only storage area and the writable storage area; and

6 recording the generated identification information in a lead-in area of the read-only
7 storage area.

1 67. The method according to claim 66, further comprising:

2 generating first control information for both the read-only and writable storage areas
3 and second control information relating to the writable storage area; and

4 recording the first control information in the lead-in area of the read-only storage area
5 and recording the second control information in a lead-in area of the writable storage area.

1 68. The method according to claim 67, wherein the first control information
2 comprises:

3 physical format information of the read-only storage area; and

4 physical format information of a control data zone of the writable storage area.

1 69. The method according to claim 67, wherein the second control information
2 comprises:
3 a connection zone to connect the read-only storage area and the writable storage area;
4 a defect management zone to manage defects in the writable storage area; and
5 a drive test zone.

1 70. The method according to claim 67, wherein:
2 the second control information comprises:
3 a connection zone to connect the read-only storage area and the writable storage
4 area,
5 a defect management zone to manage defects in the writable storage area, and
6 a drive test zone; and
7 the method further comprising:
8 reading the physical format information for the read-only storage area and the
9 writable storage area to reproduce data in the read-only storage area and the writable storage
10 areas, respectively, and reading the connection zone, defect management zone and drive test
11 zone to control the data in the writable storage area.

1 71. The method according to claim 66, wherein the identification information
2 comprises information indicating a presence or absence of the writable storage area on the
3 hybrid disc, and information on a part version of the hybrid disc.

1 72. The method according to claim 66, wherein the recording of the first control
2 information comprises recording the first control information in reserved bytes of physical
3 format information according to a digital versatile disc (DVD) specification.

1 73. The method according to claim 66, further comprising:
2 controlling a reference linear velocity for reproducing data in the read-only storage area
3 to be the same as a reference linear velocity of data at an innermost part of the writable storage
4 area.

1 74. The method according to claim 66, wherein the read-only lead-in area
2 comprises:
3 a control data zone which stores the first control information.

1 75. The method according to claim 74, wherein the first control information
2 comprises:
3 physical format information for the read-only storage area;
4 hybrid disc identification information indicating that the optical recording medium is a
5 hybrid disc having the read-only storage area and the writable storage area; and
6 physical format information for the writable storage area.

1 76. The method according to claim 75, wherein the physical format information for
2 the writable storage area is stored in bytes 1024 through 2047 of the first control information.

1 77. The method according to claim 76, wherein the physical format information for
2 the read-only storage area is stored in bytes 0 through 16 of the first control information and
3 the hybrid disc identification information is stored in bytes 17 and 18 of the first control
4 information.

1 78. The method according to claim 75, wherein the physical format information for
2 the read-only storage area comprises:
3 book type information indicating that the optical recording medium is compatible with a
4 digital versatile disk read-only memory (DVD-ROM) specification; and

5 a part version indicating a version number of the optical recording medium.

1 79. The method according to claim 77, wherein the physical format information for
2 the read-only storage area comprises:

3 book type information indicating that the optical recording medium is compatible with a
4 digital versatile disk read-only memory (DVD-ROM) specification; and

5 a part version information indicating a version number of the optical recording medium;
6 wherein the book type information and part version information are stored in byte 0 of
7 the first control information.

1 80. The method according to claim 75, wherein the hybrid disc information
2 comprises part version information indicating a version number of the hybrid disc.

1 81. The method according to claim 79, wherein the hybrid disc information
2 comprises:

3 existence information indicating that the optical recording medium is a hybrid disc
4 having the read-only storage area and the writable storage area; and

5 part version information indicating a version number of the hybrid disc,
6 wherein the existence information and the part version information are stored in bytes
7 17 and 18 of the physical format information.

1 82. The method according to claim 66, wherein the second control information
2 comprises:

3 a connection zone which connects the read-only storage area and the writable storage
4 area;

5 at least one defect management zone; and
6 a drive test zone.

1 83. The method according to claim 77, wherein the second control information
2 comprises:
3 a connection zone which connects the read-only storage area and the writable storage
4 area;
5 at least one defect management zone; and
6 a drive test zone.

1 84. A method of reproducing data from an optical recording medium having a read-
2 only storage area at an inner part of the optical recording medium, a writable storage area at an
3 outer part of the optical recording medium, and identification information stored in a lead-in
4 area of the read-only storage area to indicate that the optical recording medium is a hybrid disc
5 having the read-only storage area and the writable storage area, the method comprising:
6 reading the identification information from the lead-in area of the read-only storage
7 area;
8 reading data from the read-only and writable storage areas based upon the identification
9 information.

1 85. The method according to claim 84, wherein the optical recording medium has
2 first control information for both the read-only and writable storage areas in the lead-in area of
3 the read-only storage area and second control information relating to the writable storage area
4 in a lead-in area of the writable storage area, wherein:
5 the reading of the identification information comprises reading the first and second
6 control information; and
7 the reading of the data comprises reading the data from the read-only and writable
8 storage areas based upon the first and second control information.

1 86. The method according to claim 85, wherein the first control information
2 comprises:

3 physical format information of the read-only storage area; and
4 physical format information of a control data zone of the writable storage area.

1 87. The method according to claim 86, wherein the reading of the identification
2 information comprises reading the first control information from reserved bytes of physical
3 format information according to a digital versatile disc (DVD) specification.

1 88. The method according to claim 86, wherein:
2 the second control information comprises:
3 a connection zone to connect the read-only storage area and the writable storage
4 area,
5 a defect management zone to manage defects in the writable storage area, and
6 a drive test zone; and
7 the reading of the identification information comprises reading the physical format
8 information for the read-only storage area and the writable storage area to reproduce data in
9 the read-only storage area and the writable storage areas, respectively, and reading the
10 connection zone, defect management zone and drive test zone to control the data in the writable
11 storage area.

1 89. The method according to claim 84, wherein the identification information
2 comprises information indicating a presence or absence of the writable storage area on the
3 hybrid disc, and information on a part version of the hybrid disc.

1 90. The method according to claim 84, further comprising controlling a reference
2 linear velocity for reproducing data in the read-only storage area to be the same as a reference
3 linear velocity of data at an innermost part of the writable storage area.

1 91. The method according to claim 85, wherein the second control information
2 comprises:
3 a connection zone to connect the read-only storage area and the writable storage area;
4 a defect management zone to manage defects in the writable storage area; and
5 a drive test zone.

1 92. A method of reproducing data from an optical recording medium having read-
2 only storage area at an inner part and a writable storage area at an outer part of the optical
3 recording medium, the method comprising:
4 reproducing data from the read-only storage area and the writable storage area; and
5 controlling a reference linear velocity for reproduction of the data in the read-only
6 storage area to be the same as a reference linear velocity for recording or reproduction of the
7 data in an innermost part of the writable storage area.

1 93. A method of controlling a DVD-RAM area of an optical recording medium
2 having the DVD-RAM area in an inner part and a DVD-ROM area in an outer part of the
3 optical recording medium, wherein the DVD-RAM area includes a lead-in area having first
4 control information of physical format information for the DVD-ROM and DVD-RAM areas,
5 the method comprising:
6 reading the first control information from the lead-in area of the DVD-ROM area; and
7 controlling the data in the DVD-ROM area and the DVD-RAM based upon the read
8 first control information.

94. The method according to claim 93, wherein the DVD-RAM area has a lead-in area having second control information with connection data for the DVD-ROM and DVD-RAM areas and defect management information, the method further comprising:

accessing the DVD-RAM area and managing defects in the DVD-RAM area based upon the second control information.

[illegible]